Shorebird Migration: A Heap o' Hazards: Hurricanes, Habitat Loss & More!

A good number of shorebird species undertake incredible, long-distance migratory journeys between their wintering homes and breeding grounds each year. Many travel upwards of 15,000 miles round trip and some, nearly 20,000 miles. Many factors can limit the survival of migrating shorebirds. First of all, suitable wetland habitat is, of course, essential in both the areas where shorebirds spend the winter and in the northern areas where they breed. On the way though, they also need wetlands where they can rest and build up fat reserves to continue on their migratory jouneys. These wetland resting sites are called stopover sites or staging areas. In this simulation, students discover factors that influence migratory shorebird survival by becoming migratory shorebirds traveling from their wintering areas to their breeding habitat and back.

Materials: Large playing area (100 x 50 feet), tokens (about 5 per student), chalk or rope to mark borders and regions, one jump rope, 7 hula-hoops, a hat to designate a predator, a cardboard box (add one of each of the last two items depending on the class size).

Procedure:

1) Prepare the playing site as depicted in the diagram below. Scatter half the tokens in the nesting area and half on the return journey route.

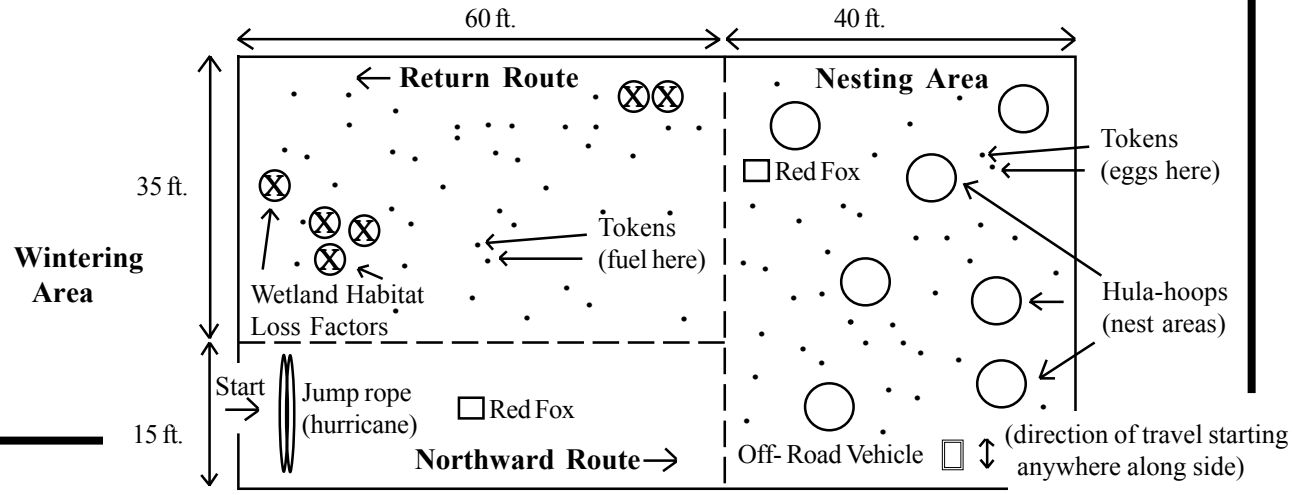
2) Begin by having students speculate some of the hazards that might affect the survival of migrating and nesting shorebirds. Hazards in this simulation will include a hurricane which blows shorebirds off course, a predator such as a red-fox that can prey upon shorebirds and their eggs, off-road vehicles that can run-over and crush nests and loss of essential wetland stopover habitat sites needed for resting and refueling.

3) Next, explain that the students will be pretending to be shorebirds migrating in the spring from their winter homes in the south, north to their breeding grounds, and then back again in the fall. Walk through the course with students first, explaining the rules and designating roles of hurricane makers, predator(s) and the off-road vehicle operator(s). Start at the wintering grounds in the southern hemisphere shown in the diagram.

Rules:

• Shorebirds begin migrating from the starting point (wintering habitat) north along the northern route on the right side of the playing field. On the way, they must pass through a hurricane (jump rope being spun). If they are touched by the jump rope the hurricane has blown them off course and they must move to the return route side of the playing field and where they become wetland habitat loss factors such as housing developments, roads, drained or polluted wetlands and other factors that impact essential wetland stop-over sites needed by shorebirds making the return jouney.

• Those that survive the hurricane continue on towards the breeding grounds. A hungry red fox (recognized by a hat or other prop) lives along the northward migration route though and can capture (using both hands) a shorebird on the way. As they are caught, captured shorebirds must be taken over to the return route area



by the red fox to become more wetland habitat loss factors. Those that avoid being caught can continue on to the breeding grounds and attempt to nest.

• Shorebirds on average lay about four eggs and their nests are usually very well camouflaged. Shorebirds on the breeding grounds must each attempt to pick up four tokens without being captured by the red fox (the fox that was capturing shorebirds along the northern migration route previously) or having their nest crushed by an off-road vehicle.

• Shorebirds are safe from the red fox only when they have both feet within a hula-hoop which represents their camouflaged nest. Only three shorebirds can occupy one hula-hoop at any time though. Late arriving shorebirds may have to wait until a hula-hoop space becomes available before they begin gathering tokens. And shorbirds venturing out to gather tokens may loose their spot if they are not quick. A red fox can capture a shorebird only when it is outside the hula hoop (do not scatter egg tokens too near to each hula-hoop to keep shorebirds from just reaching outside of the hula- hoop without leaving it.) The red fox must escort each captured shorebird to the return route portion of the playing field.

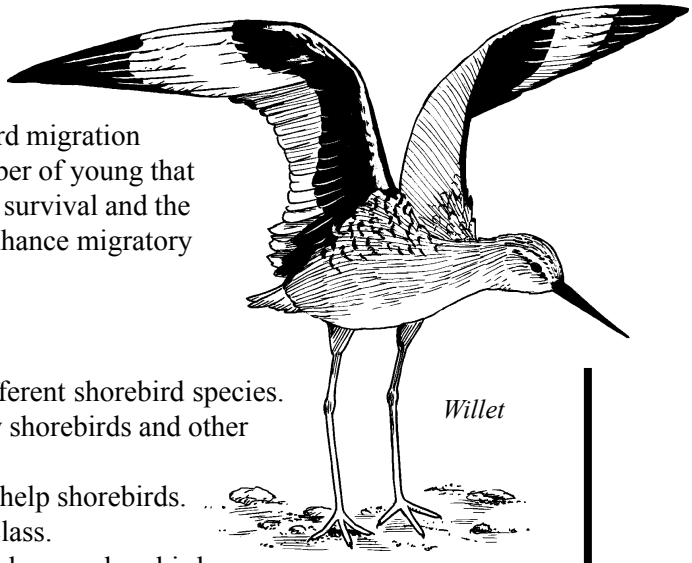
• The off-road vehicle operator must place one foot inside the cardboard box. He/she can only move across the breeding area in a direction parallel to the short borders of the playing field (he/she can travel up or down only along the side borders). The vehicle operator must catch a shorebird with two hands, either inside or outside of its nest. When caught, the shorebird looses its nest and eggs must be taken by the off-road vehcile operator to the return route portion of the playing field. The vehicle operator can temporarily leave the box at the capture spot and then return after escorting the captured shorebird away.

• Shorebirds all tend to depart the breeding grounds at a similar time in the fall. In this simulation, however, once a shorebird has managed to safely pick up four eggs, it can begin the journey back to the wintering grounds following the return route on the left side of the playing field. In nature, along the return route, shorebirds must stop at stopover sites to rest and refuel. To simulate this, shorebirds on the return route must pick up two more tokens to represent food and rest. The tokens will be scattered thoughout this area, but all of the former shorebirds that were either blown off course, caught by the red fox or had their nest destroyed by the off-road vehicle will be standing at random points along the course representing factors that eliminate essential wetland habitat. They cannot move from their spot but can reach out in an effort to capture shorebirds. If a shorebird attempting to pick up a token is caught by any of the wetland habitat loss factors then that shorebird too becomes a wetland habitat loss factor standing somewhere along the return route.

• Shorebirds able to successfully reach the wintering grounds with a total of six tokens survive their migratory journey. Four of the tokens represent their young.

4) Conduct the simulation.

5) After the simulation, engage the students in a discussion. Ask them to summarize what they have learned about shorebird migration and nesting. Address the survival rate of shorebirds, the number of young that were successfully produced, the role of predators in shorebird survival and the role of people. Have them postulate ways they can help to enhance migratory shorebird survival.



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Extensions:

1) Have students research the migration routes of several different shorebird species.
2) Have students find out about the laws protecting migratory shorebirds and other migratory species.
3) Have students investigate efforts being made by people to help shorebirds.
4) Invite a biologist to discuss shorebird migration with your class.
5) Take students on a field trip to visit a wetland preserve to observe shorebirds.